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To sum it up, Reibisch has propounded a theory that appears very improbable from the points of view of Physics and Astronomy. It is supported chiefly by imaginary evidence that exists exclusively in the fancy of the author, the few instances that might be relied upon being so scarce and so ambiguous that they cannot furnish any base for a theory of so far-reaching consequences. Thus it is impossible at all to seriously discuss this theory.

Simroth has used this absurd theory for the creation of a zoögeographical scheme. His demonstration that the distributional facts correspond to his assumptions is a complete failure, due chiefly to a lack of adequate knowledge of the respective facts. And further, Simroth's paper is written in so superficial a way for so important a subject, that we must express our astonishment at this lack of truly scientific spirit: we do not want scientific dreams and fancies, but actual, solid and faithful work. A. E. O.

Gardiner's Maldives.[1] — The third part of J. Stanley Gardiner's Fauna and Geography of the Maldive and Laccadive Archipelagoes is at hand. It contains six memoirs.

The first is by F. Jeffrey Bell on the "Actinogonidiate Echinoderms." He describes five species of Antedon, 5 of Actinometra, 13 Asteroidea, 12 Ophiruoidea and 15 Echinoidea. The collection is of the ordinary coral-reef type and consists very largely of young forms. Many of the Ophiruoides have lost the upper surface of the disc and Bell suggests that the gonads are set free by the separation of the disc.

The Orthoptera are described by Malcolm Burr. Almost all are cosmopolitan or widely distributed oriental species, probably all occurring also in India or Ceylon. The 24 species include one of the Forficularia, five of the Blattodea, one of the Mantodea, seven of the Acridiodea, four of the Locustodea and six of the Gryllodea. The commonest grasshopper, *Epacromia tamulus Fabr.*, is found abundantly throughout the Oriental region.

Borradaile gives an account of "The Xanthidæ and some other crabs" and this, like his earlier papers, is an invaluable contribution to the bionomics of species which have hitherto been known chiefly from alcoholic material. Although he is not able to explain on the ground of adaptation every feature of the different species Borradaile is evidently convinced that they can probably be so explained. The Xanthids are "Essentially crabs of the reef surface and the coral stocks." A typical Xanthid, *e. g.* Xantho, "is of a transversely oval shape, heavy and compact, with a hard cuticle and short legs which can be folded up close under the body." "The massive, compact form of the body and the strong cuticle are, no doubt, adaptations to a life spent in positions where they are surrounded with hard stony objects, and exposed at times to surf and strong currents, and at others to enemies which they are unable to escape by swimming like the Portunidæ...... Such genera as Chlorodius and Pseudozius are flatter and lighter built, with longer legs, though the cuticle is still strong, and they are more often to be found in situations like the interstices of coral stocks, where they must maintain their position by the use of their limbs, rather than by their weight or by wedging themselves fast like the heavier genera." A bionomically interesting species is *Melia tessellata*, Latr., which lives among the living branches of coral stocks. It holds in each claw a small sea anemone, which would have to be dropped whenever the crab took food with its chelipeds. "The actinians, which are firmly grasped around the middle below the tentacles, may be useful, by means of their stinging cells, either for defence or to "fish" for food with, or perhaps for both purposes." The crabs of the subfamily Trapeziinæ find shelter on branched corals but only on the living branches. They do not injure the latter but derive protection from their stinging cells. The end joints of the rather slender legs are curiously modified to secure a firm foothold on the branches. The species show color varieties, especially yellow, dark brown, banded and spotted. A new genus, Cæcopilumnus, contains a species whose orbits are so reduced that the animal appears to be absolutely blind. Finally there was found on the reef *Cryptochirus coralliodytes*, first described by Heller from the Red Sea and mentioned by Semper (Animal Life, pp. 221–223) which takes up its abode in the coral by which it becomes enclosed although not imprisoned.

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[1] Gardiner, J. Stanley. The Fauna and Geography of the Maldive and Laccadive Archipelagoes, Vol. i, Part iii. Plates XIV–XVII and text illustrations 41–7[illegible], pp. 223–346.

Of the fishes, C. Tate Regan notices 65 species from the lagoons of the atolls and six species from fresh water pools. Many of the former seem to be wide ranging. The latter "are mostly marine fishes which are known to ascend estuaries into fresh water or are allied to fishes with this habit." One species, *Barbus vittatus* Day, is a true fresh water fish.

The marine Turbellaria are described by Frank F. Laidlaw. This work is necessarily chiefly morphological. A new family of the

Cotylea — Pericelidæ — is erected. The most abundant family is that of the Pseudoceridæ. Two species found in the Maldives occur also in the tropical Pacific and two species, *Leptoplana tremellaris* and *Thysanozoon brocchii*, are widespread, occurring in north temperate as well as tropical seas.

Finally Gardiner himself has a paper on "Special observations and work relating to the formation and growth of coral reefs," still incomplete. He brings additional evidence, based on an increase in depth and extent in the lagoons since 1836, for believing that they are due to solution. The results of dredging at depths from 16 fathoms to 50 fathoms, show that the reef corals do not flourish luxuriantly below 25 fathoms, but there are other genera of corals which "flourish just beyond where the surface forms cease to exist." To test the rate of growth of reefs Gardiner studied the size of corals gathered from a channel that had been cleaned out three years before. He concludes that the reef grows at about the rate of 16 fathoms in 1000 years. He suggests that "if Falcon Island, erupted to a height of about 250 feet in 1885 and now a mere shoal, be cut down to 25 fathoms by the end of this century its place might well be marked by surface reefs, perhaps even by a perfect atoll, considerably before the year 3000 A. D." Finally the action of boring and sand-feeding organisms is discussed. The boring forms include algæ of the genus Achyla, Cliona and a Myxospongid, the mytilid Lithodomus, Sipunculoidea, a cirripede Lithrotrya and, especially, the Polychæta, above all the Eunicidæ. Of the sand feeding organisms the Holothuroidea, the Echinoids, the enteropneust Ptychodera, Sipunculus and Thalassema are important. All these organisms help in the dissolution of the coral rock by which the lagoons are made and kept open. C. B. D.

A Book on the "Birds of the Rockies"[1] might be either a careful scientific hand-book of that region, or an introduction to popular bird study, or a pleasant account of ornithological rambles. The first Mr. Keyser's book does not of course claim to be; if it is to be judged, as the second or third, we must look for enthusiasm, for a certain amount of scientific training, and for literary skill. There is a wide field open to writers who have been trained in the school of Burroughs and Torrey, who can write introductions or invitations to popular bird study in the less well-known regions of this country.

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[1] Keyser, L. S. *Birds of the Rockies.* 8vo, pp. 355. Chicago, A. C. McClurg & Co.